REMARKS

Claims 3, 5-8, 10-13 and 26-34 and 37, as amended, remain herein. Claims 35 and 36 have been cancelled without prejudice. New claim 37 has been added and incorporates the limitations of former claim 35 and 36. Claims 3, 5-8, 10, 11 and 13 have been amended to reflect the new claim dependency. No new matter has been added.

Claims 3, 5-8, 10-13 26-36 were rejected under 35 U.S.C. § 103(a) over Sakai et al. U.S. Patent Application Publication 2002/0136922 with evidence from Hosokawa et al. U.S. Patent 7,087,322. The Office Action alleges that Sakai discloses a light-emitting layer material (bisanthracene compound 6-1), a first dopant (DPVDPAN), and a second dopant (DMPAVB). In addition, the Office Action alleges that Sakai suggests the use of lower amounts of DPVDPAN.

Applicants' claims 26 and 35 recite an organic electroluminescence element comprising: a pair of electrodes, and a light emitting layer provided between the pair of electrodes, the layer comprising a light-emitting-layer material, a first dopant and a second dopant that satisfy the following relations: EV0 > EV1 and EV0 > EV2; EC0 ≥ EC1 and EC0 > EC2; EG0 > EG1 ≥ 2.6 eV and EG0 > EG2 ≥ 2.8 eV, wherein each of the first dopant and the second dopant comprises 20 wt% or less of the light emitting layer.

Contrary to the assertion in the Office Action, Sakai nowhere suggests the use of DPVDPAN in 20 wt% or less. Paragraphs [0015] and [0033] of Sakai, which are cited as allegedly supporting a lower content of DPVDPAN, are reproduced below:

> [0015] The compound represented by general formula (1) may be used singly or in combination of two or more.
>
> . . .

> [0033] In the organic EL device of the present invention, it is preferable that the ratio of the amount by weight of the light emitting material to the amount by weight of the bis-condensed aromatic cyclic compound in the layer of organic compounds is in the range of 100:1 to 40:60 since the crystallization of the layer of organic compounds can be efficiently suppressed in driving the device for a long time or under change in the thermal environment without influence on the electric properties or the life of the device.

Paragraph [0015] of Sakai suggests the use of DPVDPAN in combination with another material but nowhere suggests the use of DPVDPAN in 20 wt% or less. Paragraph [0033] of Sakai suggests that the content of DPVDPAN ranges from 40 to 100%. The Office Action speculates that if two light emitting compounds are used, each would be in a content of 20%. However, this reasoning assumes that the total level of light emitting material would be 40%. It is clear that DPVDPAN is used as a host material not as a dopant in Sakai. The bis-condensed aromatic cyclic compound is used in a content of 1 to 60% for the purpose of suppressing crystallization in the light emitting layer (see Sakai at Paragraph [0016]). All the examples in Sakai disclose the use of light emitting material of formula (1) (e.g., DPVDPAN) at a content of 49% or more. Sakai nowhere suggests the use of DPVDPAN as a dopant. A dopant performs a different function from a host material. When the content of the dopant is too high, the molecules of the dopant contact each other, thereby causing concentration quenching.

Differences in concentration are not obvious when there is evidence indicating such concentration is important to proper functioning of the invention. See MPEP § 2144.05(II)(A). In this case, applicants' specification explains that:

> In this technique, however, the light emitting layer captures both kinds of charges of holes and electrons by using a single luminescent dopant; therefore, the luminescent wavelength therefrom is inconveniently long. In other words, when materials are selected respectively in order to make the injection efficiency of charges from electrodes good, the energy gap between the valence electron level of the selected hole transporting material and the conductive level of the selected electron transporting material becomes about 2.5

> eV or less, so as to cause a problem that light having a longer wavelength than yellowish green wavelengths is emitted.
>
> In order to make the durability of an organic EL element longer, a luminescent dopant having an electron trapping property is added thereto. When the addition concentration thereof is increased to sufficiently obtain the advantageous effect of the dopant, the electron trapping property becomes stronger so as to cause a problem that the driving voltage of the organic EL element becomes high.
>
> Further, when the addition concentration becomes larger, the molecules of the dopant contact each other, thereby causing concentration quenching to result in a problem that the efficiency of the organic EL element becomes low.
>
> . . .
>
> A dopant needs to be added up to a concentration that the dopant can sufficiently capture holes injected into the light-emitting-layer material. In the case that two kinds of dopants having the above-mentioned relations are added, the concentration of the each of the dopants is relatively smaller than in the case that only one kind of dopant is added. It is therefore possible to restrain concentration quenching based on contact between the dopants. For this reason, the durability of the organic EL element can be made long.
>
> . . .
>
> The amounts of the first and second dopants added to the whole of the light emitting layer are each preferably 20% or less by weight, in particular preferably from 1 to 10% by weight. If each of the amounts is more than 20% by weight, the concentration of the dopant is too high so that the luminescent efficiency may lower.

Applicants' specification, page 4, lines 4-28; page 13, line 29 to page 14, line 8; and page 26, lines 21-26 (emphasis added here). Thus, a person of ordinary skill in this art would not view Sakai's use of DPVDPAN as a dopant, but as a host, because of its content and because of the phenomenon of concentration quenching.

In addition, Sakai nowhere discloses the use of two dopants. Applicants' use of specific amounts of two dopants which have specific valence electron levels, specific conduction levels, and specific energy gaps relative to the light emitting material, is not obvious and achieves an organic electroluminescence element having unexpectedly superior luminance, efficiency, and

durability (compare applicants' Examples 1-5 to Comparative Examples 2, 4, 6 and 9 in Table 3, at pages 49-50 of applicants' specification).

Furthermore, Sakai does not disclose applicants' claimed relationship EC0 ≥ EC1. The Office Action alleges that a difference of 0.07 eV between EC0 and EC1 is obvious and that a person of ordinary skill in the art would expect that the device would function in a similar manner to a device in which EC0 = EC1. However, as explained in applicants' specification, the conduction level of the dopant is lower than that of the light-emitting-layer material.

> As shown in FIG. 2, in this light emitting layer, the conduction level EC0 of the light-emitting-layer material is not less than the conduction level EC1 of the first dopant and the conduction level EC2 of the second dopant. That is, the relation of EC0 ≥ EC1, EC2 is satisfied. The purpose of this is to cause each of the dopants not to capture electrons. The element having such a structure can be driven at a low voltage.

Applicants' specification, page 13, lines 13-20 (emphasis added here). Because the conduction level of DPVDPAN is higher than that of the alleged light-emitting-layer material, DPVDPAN is not prevented from capturing electrons and the driving voltage becomes high.

Further, the Office Action's assertion that a difference of 0.07 eV between EC0 and EC1 is obvious, is without basis. See, e.g., Comparative Example 3 in which only the claimed energy gap relationship is not satisfied and the difference is 0.1 eV. Nevertheless, compared to applicants' Example 1, Comparative Example 3 exhibits significantly lower durability (see Table 3 at pages 49-50 of the specification). Moreover, even at a difference of 0.07 eV, the claimed valence electron level relationship EV0 > EV1 would not be satisfied because the difference between EV0 (5.72 eV) and EV1 (5.70 eV) of 0.02 eV would be trivial.

Thus, Sakai does not disclose all elements of applicants' claimed invention, or disclose anything that would have suggested applicants' claimed invention to one of ordinary skill in this

art. Further, there is no disclosure or teaching in Sakai, or otherwise in this record, that would have suggested the desirability of combining any portions thereof effectively to anticipate or suggest applicants' presently claimed invention. For all the foregoing reasons, applicants respectfully request reconsideration and withdrawal of this rejection.

Accordingly, all claims 3, 5-8, 10-13 and 26-34 and 37 are now fully in condition for allowance and a notice to that effect is respectfully requested. The PTO is hereby authorized to charge/credit any fee deficiencies or overpayments to Deposit Account No. 19-4293. If further amendments would place this application in even better condition for issue, the Examiner is invited to call applicant's undersigned attorney at the number listed below.

Respectfully submitted,

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